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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/721,233	11/22/2000	Josef P. Debbins	390086.94529	9735

7590 04/22/2005

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EXAMINER
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WOOD, WILLIAM H

ART UNIT	PAPER NUMBER
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2193

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/721,233

Applicant(s)

DEBBINS ET AL.

Examiner

William H. Wood

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

Claims 22-29 are pending and have been examined.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Vassallo et al.** (USPN 6,157,194) in view of **Li et al.** (USPN 5,602,934).

### **Claim 22**

**Vassallo** disclosed a magnetic resonance imaging system (*column 1, line 56 to column 2, line 47*), comprising:

- ♦ a pulse sequence server (*column 3, lines 18-22, controlling element*) to perform a magnetic resonance imaging scan (*column 3, lines 18-22*); and
- ♦ a workstation (*column 1, lines 43-54; column 2, lines 4-47*) coupled to the pulse sequence server for downloading program elements to the pulse sequence server to drive the RF coil and the gradient coil assembly (*column 3, lines 18-22*), the workstation including an graphical application development system (*column 1, lines 43-54; column 3, lines 41-45; column 4, lines 23-35, object oriented developed application system, at least framework*

*and modules provided)* for graphically developing a pulse description and a sequence description to define and control a waveform of control pulses provided on each of the gradient coils and the RF coil (*column 3, lines 41-45; figure 2, NT graphical input*).

**Vassallo** did not explicitly state *a magnet assembly including a polarizing magnet, a gradient coil assembly, and an RF coil*. **Li** demonstrated that it was known at the time of invention to provide in conventional MRI systems the above components (column 5, lines 10-46). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the MRI system of **Vassallo** with polarizing magnet, a gradient coil and a RF coil coupled to the driving server as found in **Li's** teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to construct a conventional system which is thus easy to implement and care for using existing technology.

**Vassallo** and **Li** did not explicitly state *the object-oriented graphical application development system including a component library storing graphical object-oriented components and a visual assembler for visually assembling the object-oriented components to form the pulse sequence*. **Williams** demonstrated that it was known at the time of invention to provide a graphical programming environment with a component library for providing object-oriented components to visually assemble a functionality (figures 3A-8F; column 2, lines 20-39; column 5, line 32 to column 13, line 41; column 7, line 66 to column 8, line 7). It would have been obvious to one of ordinary skill in the art

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at the time of invention to implement the visually operated MRI pulse generation system of **Vassallo** with object-oriented component libraries for visually assembling as found in **Williams'** teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to make use of an easily programable, non-complicated visual model (**Williams**: column 23, lines 53-62), furthermore having multiple components or a library allows for quicker reuse or development (**Williams**: column 8, lines 6-7).

#### Claim 23

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 22, wherein the pulse description is at least one of a 2D spin echo, a 2D gradient-echo, a 2D fast spin-echo, and a 3D gradient-echo sequence (**Li**: column 5, lines 10-47; column 15, line 53 to column 16, line 42; figures 10a-10d).

#### Claim 24

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 22, wherein the sequence description defines an acquisition order to define at least one a slice and a k-space sampling order (**Vassallo**: column 3, lines 18-22).

#### Claim 25

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 22, wherein the sequence description defines at least one of a 2D sequential, a 2D

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interleaved, a 3D sequential, a 3D elliptical centric, and a multi-slice CINE acquisition order (**Vassallo**: column 6, lines 33-45; column 8, lines 23-42; **Li**: column 15, line 53 to column 16, line 42).

Claim 26

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 22, wherein the workstation further provides an acquisition description, a data processing description, and a data store description (**Vassallo**: column 3, lines 4-22; column 4, lines 23-40; information provided for controlling the acquisition, processing the received data and database for storage).

Claim 27

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 22, wherein the workstation further comprises a waveform plotter for graphically displaying a pulse sequence (**Vassallo**: column 3, lines 4-10 and lines 41-45).

Claim 28

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 22, wherein the pulse description and the sequence description are provided in an application controller downloadable to the pulse sequence server (**Vassallo**: column 3, lines 18-22 and lines 41-45; the information clearly entered and sent to/used by the controller).

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Claim 29

**Vassallo** and **Li** disclosed the magnetic resonance imaging system as defined in claim 26, wherein the acquisition description includes a set of components for prescribing the real-time processing NMR signals (***Vassallo**: column 1, lines 48-53*).

***Response to Arguments***

3. Applicant's arguments with respect to claims 22-29 have been considered but are moot in view of the new ground(s) of rejection. In order to account for the amended claims, the rejections have been adjusted. The adjusted claims make clear graphical programming. Further, **Vassallo** states (column 3, lines 39-45), "In the *past*, pulse sequences for imaging had to be specified mathematically ... The *present* invention contemplates that the pulse sequence can be 'drawn' graphically ..." (emphasis added). Without doubt, the passage refers to the present time invention, not some future time. Thus, the claims stand rejected.

***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Correspondence Information***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Wood whose telephone number is (571)-272-3736. The examiner can normally be reached 9:00am - 5:30pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571)-272-3719. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9306 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.



William H. Wood  
April 4, 2005



KAKALI CHAKI  
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